



# UNITED STATES PATENT AND TRADEMARK OFFICE

52  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/930,183  | 08/16/2001  | Takayuki Ooe         | 122.1465            | 1172             |
| 21171   | 7590        | 09/23/2004           | EXAMINER            |                  |
| STAAS & HALSEY LLP<br>SUITE 700<br>1201 NEW YORK AVENUE, N.W.<br>WASHINGTON, DC 20005 |             |                      | SHENG, TOM V        |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2673                |                  |

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                               |                            |  |
|------------------------------|-------------------------------|----------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>09/930,183 | Applicant(s)<br>OOE ET AL. |  |
|                              | Examiner<br>Tom V Sheng       | Art Unit<br>2673           |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 26-28 and 32-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-28, 32-34 and 37-39 is/are allowed.
- 6) ☒ Claim(s) 35, 36, 40 and 41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. Claims 35-36 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa et al. (JP 2000-163013) and Yamada et al. ("Doubling of PDP Resolution for Moving Pictures by Use of a Virtual Pixel Technique", IDW '00, pages 703-706).

As to claims 35 and 36, Maekawa teaches a method of displaying a halftone image on a display panel (a display unit that performs a halftone display by the time-sharing method in the field - i.e. sub-frame method; see paragraph 1 under Detailed Description) by dividing one frame of the halftone image into a plurality of subframes each having a specific sustain discharge period to provide a specific intensity level (N subfields with different time weighting are used for display in a field - by choosing the existence of luminescence of each subfield; see paragraphs 2 and 3; see also figure 4a, which shows an image/view that moves 3 cells from right to left between time 0F and 1F where F is a frame/field, and because of the integrative nature of the visual-sense property of the human eye, the retina recognizes the view as moving to the right instead and inherently also as 3 cells; see paragraph 4), comprising:

preparing M sets of N subframes in the one frame (Figures 2a - 2d shows the various uses of two sets of N subframes are provided per one frame period. In particular, N is 8 in figure 2a, 10 in figure 2b, 12 in figure 2c, and 14 in figure 2d. M is 2 in all these cases.).

In Maekawa's invention, the pitch of pixels in the display and corresponding pitch of pixel on the retina are assumed the same size. However, Maekawa does not teach "setting a pitch of virtual pixels on the retina to  $1/M$ -th pitch of real pixels on the display panel".

Yamada's invention is in the same area of moving picture display, using time-sharing driving method that is the standard method used in PDP display. In particular, Yamada teaches doubling the number of perceived pixels in a moving picture by doubling the set of sub-field arrangements with one set during the time  $0 - 0.5F$  and the other set during the time  $0.5F - 1F$ . As a result, the pitch of pixels perceived is reduced in half and the display resolution is doubled. See figures 1c and 2c, and page 703-704 content under the heading "Virtual pixel technique." This reads on claimed pitch of pixels on the retina ... is made shorter than a pitch of pixels on the display panel and claimed pitch of the pixels on the retina are selected as one half of the pitch of the pixels on the display panel.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate Yamada's virtual pixel technique into Maekawa's invention because of the resolution enhancement without the need to physically reduce the pitch size of pixels on a display panel.

Modified Maekawa teaches determining light emission of subframes to the virtual pixels on the retina based on a move direction and a speed of motion of the real pixels on the display panel (the two tracks shown on figures 6a and 6b where subfields of each set of subfields inside are integrated by the retina corresponds to the pixel at X4

and is specific to the moving direction <right to left> and speed <3 subfields per field> of the input image; see also paragraph 6 on motion vector's effect on every subfield perceived by the retina); and

controlling the luminance of a virtual pixel on the retina having the  $1/M$ -th pitch of real pixels on the display panel to become substantially equal to the luminance of a pixel corresponding to an input image (by redistributing the luminescence of the 4 expressed subfields by moving the luminescence positions of each subfield of each set of subfields to within the two dashed lines recognized by the retina; see paragraph 7). Note with the redistribution, "then an original indicative data and the indicative data which a retina actually catches are made in agreement.

Apparatus claims 40 and 41 are rejected per corresponding method claims 35 and 36. Moreover, Yamada teaches two sets of subframes symmetrically provided (figure 2).

### ***Allowable Subject Matter***

2. Claims 26-28, 32-34 and 37-39 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter: none of the prior arts of record teaches the limitations regarding the assuming unit, the control unit, and the slits provided with each light-emitting cell, as cited in claims 26 through 28, and the common limitations "preparing at least two subframes having the same intensity level ...", "determining one pattern of light-emitting subframes ...", and "controlling light emission of subframes in the determined one pattern ..." of

claims 32 and 37. Claims 33-34 and 38-39 are dependent on claims 32 and 37 respectively.

### ***Response to Arguments***

4. Applicant's arguments filed on 6/30/2004 have been fully considered but they are not persuasive.

As for claims 35, 36, 40, and 41, applicant argues that Maekawa does not teach dividing the retinal pixel pitch and controlling the luminance the pixel pitch. The examiner disagrees as the rejection is based on combining Maekawa and Yamada, and the two do work together to teach the limitations.

Note Maekawa teaches based on the move direction and speed of motion as shown in figures 6(a) and 6(b) to redistributes the expressed subframes such that original data and data the retina recognizes are "made in agreement", and Yamada teaches enhancing resolution of the retinal pixels by using two sets of subframes.

### ***Comments***

According to 37 CFR 1.55(a)(3) and MPEP 706.02(b), in order to perfect the filing date of a priority document, an English translation is required if the document is not in English. Thus, in order to not consider the Yamada reference, an English translation of priority document 2000-360760 is required.

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V Sheng whose telephone number is (703) 305-6708. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2673

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Sheng  
September 9, 2004

  
Amare Mengistu  
Primary Examiner